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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,372	08/10/2001	Jun Nakagawa	110106	2666

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EXAMINER	
PAPPAS, PETER	
ART UNIT	**PAPER NUMBER**
2628	

DATE MAILED: 09/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/889,372	NAKAGAWA, JUN	
	Examiner	Art Unit	
	Peter-Anthony Pappas	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,10,11,20-22 and 27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,10,11,20-22 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

2. Claims 11, 12 and 20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

3. In regards to claims 11, 12 and 20 claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in § 101.

Data structures not claimed as embodied in computer-readable media are descriptive material per se and are not statutory because they are not capable of causing functional change in the computer. See, e.g., Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware

components which permit the data structure's functionality to be realized, and is thus statutory.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-2, 10-12, 20-22 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Foley et al. (Computer Graphics: Principles and Practice) in view of Deering (Pub. No. US 2003/0011618 A1) and further in view of Griffin (U.S. Patent No. 5, 990, 904).

6. In regards to claim 1 Foley et al. teaches a high-level conceptual framework which can be used to describe almost any interactive graphics system (p. 17, §1.6.1; Fig. 1.5). Foley et al. teaches that a raster display system, with a peripheral display processor, is a common architecture that avoids the disadvantages of the simpler raster display by introducing a separate graphic processor to perform graphics functions. Said system includes a CPU, system memory, a display processor and display processor memory, all of which are interconnected via a system bus (p. 170, § 4.3.2; Fig. 4.22). It is noted said system memory is considered to store a program and data for image generation and said display processor is considered to perform the processing for image generating.

Foley et al. teaches that depth cueing, seen as a simplified version of the effects of atmospheric attenuation, exploits the fact that distant objects (objects intended to appear father from a viewer) appear dimmer than closer object. In depth cueing interpolation occurs between the color of a given primitive (color of a given object as represented by its primitive) and a user-specified depth-cue (target) color (p. 610-611, §14.3.4; p. 727-728, §16.1.3; p. 1044-1046, §20.8.2). Foley et al. illustrates a depth cueing area in Color Plate II.24 and Color Plate II.25. It is implicitly taught by Foley et al. that said depth cueing area depends, at least to some degree, on a viewpoint as said scenes in Color Plate II.24 and Color Plate II.25 contain various graphical information displayed from a given viewpoint.

Foley et al. fails to explicitly teach varying an alpha value of the object so that the object being more distant from the viewpoint becomes more transparent. Deering teaches that simple fogging is a special case of alpha blending, in which the degree of alpha changes with distance (depth) so that the object appears to vanish into a haze (alpha varies), as the object moves away from the viewer. This simple fogging may also be referred to as depth cueing or atmospheric attenuation (p. 1, ¶ 11).

It would have been obvious to one skilled in the art, at the time of the applicant's invention, to combine the teachings of Foley et al. and Deering in regards to the details of depth cueing and atmospheric attenuation (i.e. haze), because Deering teaches how atmospheric attenuation can be achieved in regards to varying an alpha value and thus serves to further clarify the application of atmosphere attenuation to a given area when utilized in a given graphic systems.

Foley et al. and Deering fail to explicitly teach sorting objects of which alpha values are varied so that the objects are drawn in succession starting from an object nearest to the viewpoint and performing hidden-surface erasing based on a Z-buffer process for the objects of which alpha values are varied. Griffin teaches an improved method and a hardware system for merging pixel fragments, allowing for a reduction of memory usage in a given graphics rendering system (column 4, lines 66-67; Abstract). Griffin teaches that said system utilizes Z-buffering, which has the advantages of computational speed and simplicity (column 9, lines 55-57; column 3, lines 48-49). Griffin further teaches that color and alpha are accumulated using a front to back approach and that for hardware implementations front to back is preferable because the resolve process is less hardware intensive (column 42, lines 10-67; column 43, lines 1-46). Griffin further teaches that said system supports a wide range of interactive applications. Its ability to support advanced real time animation makes it well-suited for games, educational applications, and a host of interactive applications (column 7, lines 1-5).

Foley et al. and Deering fail to explicitly teach varying a depth cueing value for each vertex of the object based on a Z-value for each vertex of the object and varying the alpha value for each vertex of the object based on the Z-value for each vertex of the object. Griffin teaches that the method begins by queuing primitives in the set-up block 383. The vertex input processor 384 parses the input data stream and queues triangle data in the vertex control registers 387 (961, 962). The scan convert block 397 reads the geometric primitives queued in the set-up block. The scan convert block 397

performs pixel generation operations as soon as requested texture data is available in the texture cache 402. The pixel engine 406 performs pixel level calculations including hidden surface removal and blending operations. To perform hidden surface removal, the pixel engine 406 compares depth values for incoming pixels (fully covered pixels or pixel fragments) with pixels at corresponding locations in the pixel or fragment buffers. After performing the pixel level calculations, the pixel engine stores the appropriate data in the pixel or fragment buffers (column 32, lines 55-67; column 33, lines 1-37). As illustrated in Fig. 9A-9B said pixel information is generated from said vertex information and thus said pixel information is considered to represent said vertex information.

Griffin further teaches that the merge test blocks 1000-1008 compare the depth, color and alpha components for new and previous pixel fragments, and if the new and previous values are within a predetermined tolerance, they output a bit indicating that the new pixel fragment is a merge candidate. The pixel engine then performs a bitwise AND (1010) to determine whether each of the merge tests has passed. If so, the pixel engine merges the new and previous pixel fragments. The pixel engine can attempt to merge an incoming pixel fragment only with the pixel fragment closest to the viewpoint (with lowest z value) or can attempt to merge with several pixel fragments stored for a pixel location (column 37, lines 48-67; column 38, lines 1-20). It is noted that the merging or insertion of fragments would result in the modification or creation, respectively, of depth and alpha values.

It would have been obvious to one skilled in the art, at the time of the applicant's invention, to incorporate the teachings of Griffin into the system taught by both Foley et

al. and Deering, because through such an incorporation the amount of memory required for the storage of the image data within the graphics system would be reduced, thus requiring less physical memory to be implemented or allocated within said graphics system for the storage of said image data, while at the same time said incorporation would utilize conventional graphic techniques, such as a Z-buffer, which would not require specialized hardware to be implemented.

Foley et al. teaches a viewing means by which rendered (drawn) objects are viewed dependent on a given perspective projection, wherein the presented view of said objects change in accordance with the change of said perspective projection. The visual effect of said perspective projection is similar to that of photographic (camera) systems (p. 230-236, § 6.1). Foley et al. also teaches a synthetic camera (p. 299-302, § 7.3.4).

7. In regards to claim 2 the rational disclosed in the rejection of claim 1 is incorporated herein (p. 610-611, §14.3.4; p. 727-728, §16.1.3; p. 1044-1046, §20.8.2). It is noted that the interpolation between said primitive color and said user-specified depth-cue color is considered to yield a spectrum of colors, wherein said spectrum of colors is a combination of said primitive color and said user-specified depth-cue color.

8. In regards to claim 10 the rationale disclosed in the rejection of claim 1 is incorporated herein.

9. In regards to claim 11 Foley et al. teaches that the graphics system is thus an intermediary between the application program and the display hardware (p. 17-19, § 1.6.1-1.6.2). The rationale disclosed in the rejection of claim 1 is incorporated herein.

10. In regards to claim 20 Foley et al. teaches that the graphics system is thus an intermediary between the application program and the display hardware (p. 17-19, § 1.6.1-1.6.2). The rationale disclosed in the rejection of claim 1 is incorporated herein.

11. In regards to claim 21 the rationale disclosed in the rejection of claim 1 is incorporated herein. It is noted said system is considered to perform the method.

12. In regards to claim 22 the rationale disclosed in the rejection of claim 2 is incorporated herein.

13. In regards to claim 27 the rationale disclosed in the rejection of claim 1 is incorporated herein. It is noted said system is considered to perform the method.

Response to Amendment

14. The prior 35 U.S.C. 112 first paragraph rejection has between withdrawn in lieu of Applicant's remarks.

15. In regards to Applicant's remarks that none of the applied reference teach or suggest "...the depth cueing area being based on a position of the viewpoint..." it is noted that Foley et al. illustrates a depth cueing area in Color Plate II.24 and Color Plate II.25. It is implicitly taught by Foley et al. that said depth cueing area depends, at least to some degree, on a viewpoint as said scenes in Color Plate II.24 and Color Plate II.25 contain various graphical information displayed from a given viewpoint. It is noted that neither the respective claim language or the specification discloses that said depth cueing area is based solely on a position of the viewpoint.

16. In regards to Applicant's remarks that it was agreed upon during the interview held on 5/23/06 that none o the applied reference teach or suggest "varying a depth

cueing value for each vertex... varying the alpha value for each vertex..." it is noted that said limitations which were originally disclosed in claims 5, 6, 15, 16, 25 and 26 were rejected under cited prior art. The incorporation of said limitations into respective independent claims does not render said limitation allowable. Applicant is directed to the respective rejections above.

17. Applicant's remarks have been fully considered but are not deemed persuasive.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter-Anthony Pappas whose telephone number is 571-272-7646. The examiner can normally be reached on M-F 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner
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